L 34866-65 EWT(l)/EWI(m)/EWP(t)/EWP(b) IJP(c) JD
ACCESSION NR: AP5005058 S/0051/65/018/002/0347/0349

AUTHOR: Georgobiani, A. N.; Matinyan, Ye. G.; Savin, A. N.

TITLE: Low voltage electroluminescence of ZnS

SOURCE: Optika i spektroskopiya, v. 18, no. 2, 1965, 347-349

TOPIC TAGS: electroluminescence, zinc sulfide optic material, impact excitation, voltage dependence

ABSTRACT: Inasmuch as earlier studies of low-voltage electroluminescence of ZnS were made under conditions in which minority carrier injection was possible, the authors excluded this possibility by exciting the electroluminescence by the Destriau method (J. Chim. Phys. v. 33, 620, 1936). In this case the luminor crystallites are mixed with the dielectric, which insulates them from the electrodes. The resultant electroluminescent capacitors were similar to those investigated by one of the authors earlier (with M. V. Fok, Opt. i spektr. v. 9, 775, 1960) but the thickness was approximately 10 μ and the capacitor electrode area was 4.1 cm^2. At low voltages each elementary capacitor produced approximately 5000 quanta per second, corresponding to approximately one quantum from each small crystal every

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L 34866-65
ACCESSION NR: AP5005058

10,000 cycles. Measurement of the dependence of the electroluminescence brightness on the voltage at 63 cps showed a noticeable variation at voltages between 2.4 and 3 V. The frequency dependence of the brightness also changed noticeably with decreasing voltage, with the maximum brightness shifting towards lower frequencies with decreasing voltage. The results are interpreted from the point of view of the fact that at low voltages the predominant mechanism producing the glow is impact excitation of the luminescence centers. Orig. art. has: 2 figures.

ASSOCIATION: None

SUBMITTED: 16Apr64 ENCL: 00 SUB CODE: OP

NR REF SOV: 001 OTHER: 003

Card 2/2

SAVIN, A.P.

Decompositions of perfectly normal spaces. Dokl.AN SSSR 138 no.5: 1029-1032 Je '61. (MIRA 14:6)

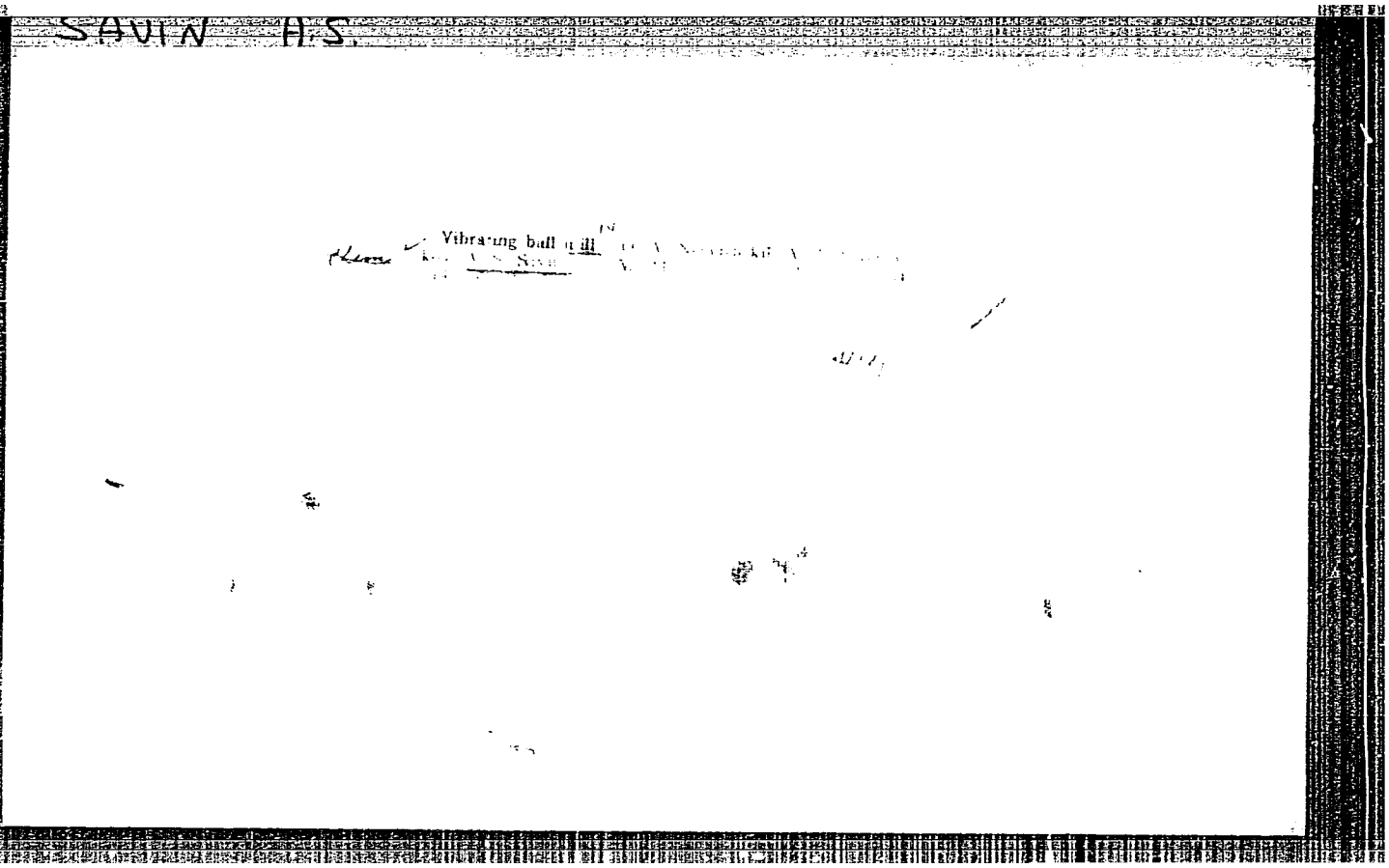
1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova. Predstavleno akademikom P.S.Aleksandrovym.
(Topology)

SAVIN, A. P.

Dissertation defended for the degree of Candidate of Physicomathematical Sciences at the Mathematical Institute imeni V. A. Steklova 1962:

"Group of Generalized Foldings [razbiyeniya] of Wholly Normal Spaces."

Vest. Akad. Nauk SSSR. No.4, Moscow, 1963, pages 119-145



SOV/136-59-5-17/21

AUTHORS: Savin, A.V., and Eyduk, Yu.A.

TITLE: Low-Temperature Sintering of Molybdenum (Nizkotemperaturnoye spekaniye molibdena)

PERIODICAL: Tsvetnyye metally, 1959, Nr 5, pp 81-84 (USSR)

ABSTRACT: The possibility of obtaining Mo by sintering at 1400 - 1700 °C was investigated. Mo powder reduced at various temperatures (Fig 1), and a hydrogen atmosphere with varying moisture contents were used. The powder was pressed into slabs 12X12X500 mm and heated. The specific weight before and after sintering was found. The compacting pressures used were 4 and 10 T/cm^2 for fine and coarse powder, giving specific weights of 5.5-6 and 9 g/cm3 respectively. The results of sintering were estimated by the compacting coefficient, (K) i.e. the ratio of the volume of a pore after sintering to the original volume. Table 1 shows the least values of K or the best sintering properties are obtained using Mo powder reduced at 870 °C. With increase in reducing temperature K increases. The effect of moisture content is seen in the first hour of sintering and is less at 1600-1700 °C than at 1400-1500 °C (Figs 1 and 2).

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Low-Temperature Sintering of Molybdenum

The rate of oxidation in the first hour can be retarded by addition of 0.1% C to the Mo powder. Above 1500 °C the beneficial effect of the C falls off presumably because the oxidation ability of water vapour also decreases. Table 2 shows the gas content of Mo produced by low temperature sintering is the same as that in Mo produced by conventional methods. The finest grained structure is obtained from fine powder sintered at 1400-1500 °C and is 5-10 μ. At 1600-1700 °C it is 15-20 μ. Moisture has no effect on the grain size in 1-3 hours. Metallographic examination showed that the coarser the powder the slower the recrystallization. Table 3 shows the results of mechanical tests on 2, 0.9 and 0.5 mm Mo wire produced from the low temperature sintered slabs. Fig 3 shows the change in mechanical properties of 0.5 mm diameter wire after tempering for 3 hours at various temperatures. The wire made from

Low-Temperature Sintering of Molybdenum

coarse-grained powder has the highest mechanical properties.
There are 3 figures, 3 tables and 8 references, of which 3 are English, 1 is German and 4 are Soviet.

S/736/60/000/002/001/007

AUTHORS: Savin, A.V., Eyduk, Yu.A.

TITLE: The making of a Co W sintered alloy for tool manufacture.

SOURCE: Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov. Sbornik trudov. no.2. Moscow, 1960. Tverdyye splavy. pp.15-23.

TEXT: Fundamental parameters that facilitate the making of a compact single-phase alloy with a low gas content are discussed. A suitably heat-treated Co W alloy exhibits outstanding strength and wear- and corrosion-resistance characteristics which render it eminently suitable for use in the shafts of vibration-resistant tools (or instruments) in lieu of steel. W.P.Sykes' phase diagram (Am. Soc.Steel Treating, Trans., v.21, 1933, 5 //Abstracter's note: See also ibid., p.385//) shows that at the eutectic temperature Co dissolves about 35% W. In an alloy with 25% W, a single-phase β solid solution exists only above 1075°C, whereas below 1075° the alloy consists of two phases, β and ε. Precipitation of the ε phase in the supersaturated solid solution leads to dispersive hardening of the alloy at T>500°. St. Stolarz (Metal and Production of Cobalt-Tungsten Alloy, v.IX-X, no5, 1953, 298-302 //sic!//) describes a sintering method for the preparation of a 75% (by weight) Co and 25% W alloy, details of which are summarized. The authors

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used ammonium paratungstate (APW) produced by the "Pobedit" factory and tungsten anhydride (WA) of the hard-alloy plant of the Sverdlovsk Council of the National Economy. The APW was calcinated to WA at 600°C in a muffle furnace. The WA was reduced to W in a H stream in a two-stage tubular furnace 51 mm ID and 1500 mm long. 50-g batches of WA were treated in 30x200-mm reaction boats; in Stage I the boat advanced at 13.3 mm/min, at 650°, in an 800-1000 l/hr H stream, and in Stage II at 10.0 mm/min, at 800°, in a like H stream. The resulting W powder was sifted through a No. 0.112-0.1 (130-150-mesh) sifter and was stored in a tightly stoppered glass container; it contained 0.3-0.6 mg/g adsorbed methanol, 0.2-0.3% O; its dry uncompressed weight was 0.9-1.1 g/cm^3. The Co_3O_4 was reduced to metallic Co in the same furnace in 120-g batches carried in 30x400-mm iron boats, advancing at 13.3 mm/min at a temperature of 580° and in a 1000 l/hr H stream. The resulting Co powder was sifted through a No. 0.112 (150-mesh) sifter and stored. It contained 0.2-0.5% O, 0.4-0.5 mg/g adsorbed methanol; its dry, uncompressed weight: 0.6-0.7 g/cm^3. A 75/25 (by weight) Co/W-powder charge was mixed in a 5-liter 180-mm dia porcelain ball mill with 25-mm dia porcelain balls; ball weight totaled 1/2 charge weight. Heavier ball weight would have produced hardened shiny Co flakes. The mixture was pressed into 10x10x400-mm rods in a dismantleable steel die at a 3 ton/cm^2 pressure. The rods were sintered in two stages in an alundum furnace with Mo sheathings; temperature and sintering

time were varied; the H atmosphere had a humidity of 10-12 /humidity criterion and units unspecified/ and a dew-point temperature of 25°C. The sintered rods attained a compact metallic appearance and became fully homogenized into a single-phase β solid-solution structure. Under preliminary sintering at 800° the shrinkage is negligible (spec.grav. 5.42 g/cm^3), at 900° the sp.gr. is 6.06, at 1000° 7.80, at 1100° 8.59. The effects of various sintering procedures on the microstructure and density of the resulting β phase are tabulated. Following a preliminary sintering at 800° the ultimately sintered alloy was free of inclusions. Yet, under identical second sintering, specimens initially sintered at 1100° (series II) contained, as a rule, extraneous inclusions, the composition and cause of which is unknown. In samples sintered directly at 1300-1350° without presintering (series III) the structure was completely homogenized, but their porosity (2-4%) exceeded that of presintered specimens (0.2-1.5%). The time of presintering at 800°, up to 3 hours, did not affect the homogeneity and density of the alloy upon second sintering. The gas content of the ultimate product is minimized by a low initial gas content of the component powders (usually 0.3-0.5% by weight), a low humidity of the H atmosphere, and a long holding time during secondary sintering. The presintering does not produce a significant degassing effect, but the second sintering may reduce the gas content by 90% or more. Recommendations: (1) O content in the initial W powder should not exceed 0.3% and in the Co powder 0.5%; (2) to reduce

the ultimate gas content, the dew-point temperature in the H atmosphere should not exceed 15°C. (3) for total homogenization and optimal compactness of the alloy, first sintering requires 1-2 hours at 800°C, second sintering 4 hours at 1300-1350°. There are 5 figures, 4 tables, and the 2 English-language references cited in the body of the abstract.

ASSOCIATION: None given.

Card 4/4

86695

S/180/60/000/006/005/030
E193/E335

18.6200

AUTHOR: Savin, A.V. (Moscow)

TITLE: A Powder-metallurgy Method of Fabricating Alloyed Molybdenum Rods

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1960, No. 6, pp. 47 - 50

TEXT: The object of the present investigation was to establish conditions under which molybdenum-base alloys, with the lowest gas (particularly oxygen) and carbon contents, could be prepared by the powder metallurgy technique. Three types of molybdenum powder, obtained by reduction at 900, 1300 and 1500 °C and differing in their oxygen content and particle size, were used in the experiments. The alloying additions (titanium or zirconium) were introduced either as pure powders or as molybdenum-base master alloys. The powder compacts, measuring 12 x 12 x 500 mm, were prepared under pressure of 4 t/cm^2. Sintering was carried out either in hydrogen (dew point of zero °C) or in vacuum

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S/180/60/000/006/005/030
E193/E335

A Powder-metallurgy Method of Fabricating Alloyed Molybdenum Rods

(10^{-3} mm Hg). The compacts were heated by passage of electric current. The sintering cycle consisted, in every case, of heating the test piece to 2100 °C in 20 min and holding it for 20 min at this temperature. Linear shrinkage during sintering increased with decreasing particle size of the powders employed, being 3-4 and 10-12% in compacts made from coarse and fine powders, respectively. Alloys prepared from coarse powders, containing 80% of particles 0.1-1.0 μ in diameter, had the lowest gas content after sintering. It was found that in the case of vacuum sintering, the oxygen content in the alloy is considerably reduced if the starting material contains more than 0.05% C, which acts as a deoxidant. When, however, the carbon content in the starting material exceeds 0.1%, no further reduction in the oxygen concentration takes place and a new phase in the form of inter-granular

Card 2/3

28879
S/180/61/000/004/017/020
E073/E535

18.1247 1454

AUTHORS: Baskin, M.L., Savin, A.V., Tumanov, V.I. and Eyduk, Yu.A. (Moscow)

TITLE: Mutual solubility of copper and molybdenum and certain properties of molybdenum-copper alloys

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1961, No.4, pp.111-114

TEXT: Mo-Cu alloys are extensively used for electric contacts. The authors prepared alloys containing 1.5 to 14% Cu by means of current powder metallurgy methods. Sintering of molybdenum was carried out at 1700°C and the alloys of molybdenum with low contents of copper (1.5 to 10% by weight) were sintered at the same temperature. At lower temperatures, either no sintering took place at all or the material was very porous. The alloy with 14% Cu sintered at 1600°C. The porosity of the produced alloys (determined metallographically) was about 0.6 volume % and that of pure Mo was about 1 volume %. The grain size of the molybdenum phase was approximately the same for all the alloys and also for pure molybdenum, i.e. mainly 25-30 μ. To obtain grains

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resistance values are averages from 36 measurements, whereby the maximum error was ±2% and the deviations from the average value did not exceed 0.3%. The coefficient of linear expansion was determined by means of a dilatometer with quartz rods and indicator head in the temperature range 18 to 400°C, the error being within the limits of ±2.5%. To determine the influence of admixtures which are important in the industrial manufacture of Mo-Cu alloys, a series of melts were produced containing admixtures of C, Si and SiO_2. Table 3 gives the obtained results for Mo-Cu alloys with 3, 5 and 8% Cu, respectively and the following admixtures in wt.%: 0.05% C, 0.05% Si, 0.10% Si, and 0.50% SiO_2 ($\rho \cdot 10^2$ Ohm mm^2/m; a,kX). The influence of nickel (wt.%) on the electric resistance ($\rho \times 10^2$ Ohm mm^2/m) of Mo-Cu alloys with 5% Cu was as follows: 0 - 7.10; 0.5 - 10.31; 1.0 - 12.94; 3.0 - 14.92; 5.0 - 15.29. L. G. Grigorenko, A. A. Maksimov and A. A. Cheredinov participated in the experimental work, L. Kh. Pivovarov carried out the X-ray structural analysis and M. N. Nalimova carried out the metallographic investigations. There are 3 figures, 4 tables and

PETROKAS, L.V.; [illegible], P.V.; [illegible], P.M.; SAVIN, A.V.; MERCHOVA, T.I.

Testing of the IPI 65-30 rotary line at the "Kambolit" plant.
Trudy NIIKHM 2:12-35 '62. (MIRA 18:8)

L 2849-66 EWT(m)/EWP(w)/T/EWP(t)/EWP(b)/EWA(c) LJP(c) JD/JG

ACCESSION NR: AT5022902 UR/2776/65/000/043/0164/0168

AUTHOR: Seleznev, L. A.; Savin, A. V.

TITLE: Hot twist tests of sintered molybdenum

SOURCE: Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii. Sbornik trudov, no. 43, 1965. Poroshkovaya metallurgiya (Powder metallurgy), 164-168

TOPIC TAGS: torsion strength, molybdenum, metal powder, sintering, deformability, brittleness, ductility, aluminum oxide

ABSTRACT: The quality of sintered molybdenum briquets destined for hot deformation is usually evaluated according to their specific weight, shrinkage during sintering, and state of surface. These criteria, however, do not provide an adequate idea of their technological deformability, which is determined by plasticity and deformation resistance. Hence, the authors investigated the technological deformability of sintered molybdenum by means of the hot twist method, which normally is employed to test high-temperature alloys and metals. The specimens were prepared from molybdenum powder reduced under different conditions: in a

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ACCESSION NR: AT5022902

steel-tube furnace at 900°C (group 1) and in a muffle furnace -- the muffle being of a high-alumina material -- at 1000°C (group 2). The powder in group 2 was coarse-grained, since its reduction was carried out at a higher temperature, and had a high content of alumina owing to its contamination by the muffle material. Rods of sintered molybdenum were subjected to hot twist tests in a K-50 machine which, for this purpose, was equipped with an electric molybdenum-heater furnace operating at temperatures of up to 1600°C in a hydrogen atmosphere (Fig. 1). The dimensions of the selected standard specimens (d = 10 mm, rated length 100 mm) made it possible to employ a single, fixed scale with a maximum torque of 98.1 joules (10 kg-m) throughout the tests in the 20-1600°C temperature range. Curves of the number of twists required for fracture (characterizing the plasticity of the material) were plotted as a function of temperature (Fig. 2) and were found to differ sharply for each group: for group 1 they had a distinct peak at 1100°C, whereas for group 2 the peak is shifted in the direction of higher temperatures and extends over a wider temperature interval. At room temperature brittle fracture is observed for both groups; at 200-1150°C ductile fracture is observed for group 1 and at 150-1400°C for group 2. The differences in the behavior of sintered Mo in both groups during hot twist tests apparently exist because group

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ACCESSION NR: AT5022902

2 contains a sizable proportion of aluminum oxide, which contributes to retarding the recrystallization processes and hence also to broadening the temperature range of plasticity. Thus, the hot twist method has proved its worth as a criterion for evaluating the technological deformability of sintered molybdenum. Orig. art. has: 3 figures, 2 tables.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 02 SUB CODE: MM

NO REF SOV: 002 OTHER: 002

Card 3/5

L 2849-66

ACCESSION NR: AT5022902 ENCLOSURE: 01

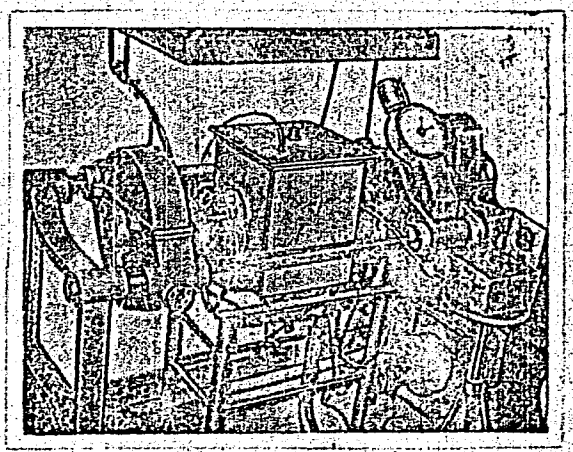

Fig. 1. General view of torsional testing machine

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L 2849-66

ACCESSION NR: AT5022902 ENCLOSURE: 02

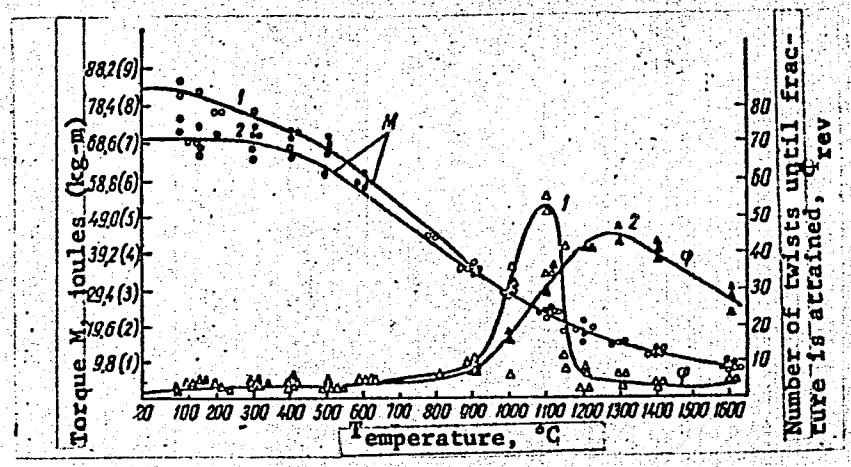

Fig. 2. Curves of variation in torque M and number of twists of sintered Mo rods as a function of temperature

BVK

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34356
S/203/61/001/006/016/02
D055/D113

9,6150

AUTHORS: Mel'nikov, V.V., Savenko, I.A., and Savin, B.I.

TITLE: The use of electrostatic analyzers for studying the soft charged component of cosmic rays

PERIODICAL: Geomagnetizm i aeronomiya, v. 1, no. 6, 1961, 981-994

TEXT: The authors describe the use of spherical electrostatic analyzers of high light-intensity with large entry windows for studying the spectra of low-energy particles in cosmic radiation. A Faraday cylinder with an electrometrical circuit may be used as a recording device. Transmittance and light intensity for particles with equiponderant energy are calculated for analyzers with either an acute angular or funnel-shaped diagram of sensitivity. The influence of scattered fields is not included in the calculations and it is assumed that the width of the gap between the electrodes of the deflecting capacitor was small, compared with the mean radius of the gap. The study of the soft ion and electron components has an

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S/203/61/001/006/017/021
D055/D113

AUTHOR: Savin, B.I.

TITLE: An electrostatic analyzer of high light-intensity, receiving particles from a hemisphere

PERIODICAL: Geomagnetizm i aeronomiya, v. 1, no. 6, 1961, 995-998

TEXT: The author describes a new spherical electrostatic analyzer with opposed trajectories and deflection to 180°. Transmittance $(\Delta E/E_o)_{lim}$ and light intensity L_o for particles with equiponderant energy are calculated without the inclusion of the influence of the scattered field and on the assumption that the width 2a of the gap between the electrodes of the deflecting capacitor is small compared with the mean radius of the gap r_o. For an analyzer where $a/r_o = 0.1$, the values for $(\Delta E/E_o)_{lim}$ and L_o are 0.1 and $0.202 r_o^2$ $cm^2 \cdot sterad$, respectively. There are 4 figures and 2 references: 1 Soviet and 1 non-Soviet. The English-language reference is: F.T. Rogers. Rev. Sci. Instr., 1951, 22, 723.

Card 1/2

LOGACHEV, Yu.I.[translator]; TIMOFEYEV, G.A.[translator]; GORCHAKOV, Ye.V.[translator]; ASTAF'YEV, V.A.[translator]; SAVIN, B.I. [translator]; SHABANSKIY, V.P., red.; PAPTAYEVA, V.A., red.; DUBKOVA, S.I., red.; PRIDANTSEVA, S.V., tekhn. red.

[Solar corpuscular streams and their interaction with geomagnetic field]Solnechnye korpuskuliarnye potoki i ikh vzaimodeistvie s magnitnym polem Zemli. Moskva, Izd-vo inostr. lit-ry, 1962. 438 p. Translated from the English. (MIRA 15:11)

1. Nauchno-issledovatel'skiy institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta (for Logachev, Timofeyev, Gorchakov, Astaf'yev, Savin).
(Solar radiation) (Magnetism, Terrestrial)

SAVIN, B.I. [translator]; TIMOFEYEV, G.A. [translator]; SHABANSKIY, V.P., red.; SAMSONENKO, L.V., red.; DZHATIYEVA, F.Kh., tekhn. red.

[Earth's radiation belts] Radiatsionnye poiasa Zemli. Moskva, Izd-vo inostr. lit-ry, 1962. 208 p. (MIRA 16:4)
Translated from the English
(Van Allen radiation belts)

L 29971-65 EWT(d)/FSF(h)/FSS-2/EWT(l)/EEC(m)/FS(v)-3/EEC(k)-2/EWG(s)-2/EWG(v)/
EWA(d) Pn-4/EE (t)/EEC(c)-2/EWA(h) Pn-4/Po-4/Pe-5/Pq-4/Pac-4/Pg-4/Pi-4/
Pk-4/Pl-4/Pae-2/Ped AS(I/IT/GW-2/AS

ACCESSION NR: AP5005447 S/0293/65/003/001/0172/0174

AUTHOR: Goryunov, N. N.; Savin, B. I.; Sosnovets, E. N.

TITLE: Transistorized electrometric amplifier for measuring weak currents from charged-particle detectors

SOURCE: Kosmicheskiye issledovaniya, v. 3, no. 1, 1965, 172-174

TOPIC TAGS: transistorized amplifier, electrometric amplifier, charged particle detector, weak current measurement, atmospheric radiation detection/Cosmos 12, Cosmos 15

ABSTRACT: A transistorized amplifier for measuring weak currents ($< 10^{-7}$ amp) is described, in which the conversion of dc into voltage pulses proportional in amplitude to the current is realized by means of a capacitor and a relay. The device permits digital registration of the measured current and by virtue of its compact size is a useful component in space probes. Since it is virtually insensitive to the polarity of the measured current, it can be used with either electron or positive-ion detectors. The circuit contains four amplification stages and a nonlinear negative feedback circuit which increases the gain by a factor of 10. For registering widely varying current, several individual amplifiers can be used. Three of

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ACCESSION NR: AP5005447

the amplifiers were used to measure weak current in the charged-particle collectors of the electrostatic analyzers aboard Cosmos-12 and Cosmos-15. The total dynamic range of the circuit was 1000; the maximum number of pulses in a sequence was 40. Threshold sensitivity of the first amplifier was 10 mv. Threshold current was roughly 8×10^{-15} amp; intensity was 6×10^{6} $1/E_0$ part/cm^2/sec/kev (where E_0 is the particle energy in kev to which the analyzer is adjusted). Orig. art. has: 2 figures. [DW]

ASSOCIATION: none

SUBMITTED: 18Apr64 ENCL: 00 SUB CODE: EC, NP

NO REF SOV: 000 OTHER: 000 ATD PRESS: 3196

Card 2/2

L 27192-65 EWT(d)/EWT(l)/EEC(m)/FSF(h)/FSS-2/FS(v)-3/EEC(k)-2/EWG(s)-2/EWG(v)/
[illegible] Pe-5/Pq-4/Pg-4/Pac-2/
Pab-10/P4-4/Pl-4 TT/AIT/GW/RC

AUTHOR: Mel'nikov, V. V.; Savenko, I. A.; Savin, B. I.; Shavrin, P. I.

TITLE: Experience in the use of an electrostatic analyzer on Cosmos-12

SOURCE: Geomagnetizm i aeronomiya, v. 5, no. 1, 1965, 148-154

TOPIC TAGS: electrostatic analyzer, ionization measurement, ion current, spaceborne ionization measurement, electron detection

ABSTRACT: Cosmos-12 (apogee, 405 km; perigee, 211 km) and Cosmos-15 (apogee, 371 km; perigee, 173 km) were equipped with identical electrostatic analyzers for the study of electron and positive ion currents with energies of 1 kev. The analyzer (see Fig. 1 of Enclosure) is basically a spherical capacitor with symmetrical potentials applied to the plates. The charged particles entering into the gap between the plates are deflected by the electric field and strike a Faraday cylinder, which serves as the collector. The angle of deflection of a particle projected along the zero equipotential in the gap was 120°. Additional deflections at the input and output of the gap did not exceed 2.5°. The copper capacitor plates were silverplated to reduce light reflection in the ultraviolet region. The radius of the outer surface of the gap was 66 mm; that of the inner, 54 mm. Conical shields were mounted

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L 27192-65
ACCESSION NR: AP5005197

in front of the input and behind the output of the gap to reduce the effects of stray fields. The passband width of the analyzer was approx 30%; its threshold sensitivity under isotropic conditions was approx 6 x 10^6 part/cm^2·sec·kev. The following conclusions are drawn from measurements made with the analyzer during the flight of Cosmos-12: 1) The intensities of electrons and ions with energies of 1 kev on the night side of the Earth were usually lower than the threshold sensitivity of the analyzer. 2) On two orbits, the analyzer registered higher electron and ion intensities (> 10^8 part/cm^2·sec·kev) over the equatorial regions of the Pacific, due presumably to the effects of a solar flare of magnitude 1 which occurred during the flight. 3) No constant intensity levels exceeding 6 x 10^6 part/cm^2·sec·kev were measured during the daytime sectors of the flight. 4) To the south of New Zealand, occurrences of increased intensity ($\sim 10^8$ part/cm^2·sec·kev) were registered on the 28th and contiguous orbits. Orig. art. has: 4 figures. [DW]

ASSOCIATION: Moskovskiy gosudarstvennyy universitet, Institut yadernoy fiziki (Moscow State University, Institute of Nuclear Physics)

SUBMITTED: 17Sep64 ENCL: 01 SUB CODE: EC, EM

NO REF SOV: 003 OTHER: 003 ATD PRESS: 3191

Card 2/3

L 27192-65

ACCESSION NR: AP5005197

ENCLOSURE: 01

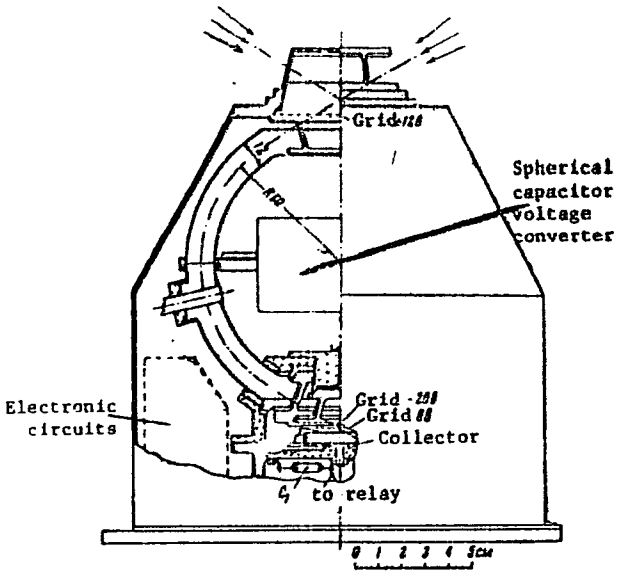

Fig. 1. Electrostatic analyzer

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L 2886-66 FSS-2/EWT(l)/FS(v)-3/FCC/EWA(d)/EWA(h) TT/GS/GW

ACCESSION NR: AT5023607 UR/0000/65/000/000/0381/0387

AUTHOR: Vernov, S. N.; Mel'nikov, V. V.; Savenko, I. A.; Savin, B. I.; Pervaya, T. I.

54
54+1

TITLE: Recording of charged particles of energies of 0.1—10 kev with a spherical electrostatic analyzer

SOURCE: Vsesoyuznaya konferentsiya po fizike kosmicheskogo prostranstva. Moscow, 1965. Issledovaniya kosmicheskogo prostranstva (Space research); trudy konferentsii. Moscow, Izd-vo Nauka, 1965, 381-387

TOPIC TAGS: satellite, satellite data storage, particle counter, electron density, ion density/Elektron 2 satellite

ABSTRACT: Identical spherical electrostatic analyzers were used to record positive and negative particles with energies of up to 1 kev on Cosmos-12 and Cosmos-15 and up to 10 kev on Elektron-2. Each analyzer was comprised of a spherical capacitor some 60 mm in diameter, with input apertures leading to plates spaced 12 mm apart, on which a periodic high voltage was programmed so as to allow passage through the annular gap of only particles of a desired energy range. A Faraday cylinder at the

Card 1/3

L 2886-66

ACCESSION NR: AT5023607

gap output served as the collector. The input apertures and the Faraday cylinder were furnished with biased grids to eliminate thermal particles and secondary emission, respectively. A diagram of the two analyzers used on Elektron-2 is shown in Fig. 1 of the Enclosure; accumulated charge was converted to binary code. The Cosmos data generally showed that electron flux at the 1-kev level did not exceed $10^7/cm^2/sec/kev$ at night and was only slightly higher by day. A maximum was noted during the southernmost portions of orbit, in a region south of New Zealand, attaining up to 12 x $10^8/cm^2/sec/kev$. Electron fluxes recorded on Elektron-2 showed strong variations at sunrise and sunset (referred to the satellite); these variations reached values on the order of $10^9/cm^2/sec/kev$. Irregular variations in flux readings correlated with known geomagnetic events observed during the flight. Data show that the satellite was at all times within the magnetosphere. Positive ion flux registered by Elektron-2 in the 0.1—10-kev range did not exceed 5 x $10^7/cm^2/sec$. Orig. art. has: 5 figures and 1 table. [SH]

ASSOCIATION: none

SUBMITTED: 02Sep65 ENCL: 01 SUB CODE: ES, NP

NO REF SOV: 008 OTHER: 003 ATD PRESS: 4109

Card 2/3

L 2886-66
ACCESSION NR: AT5023607

ENCLOSURE: 01

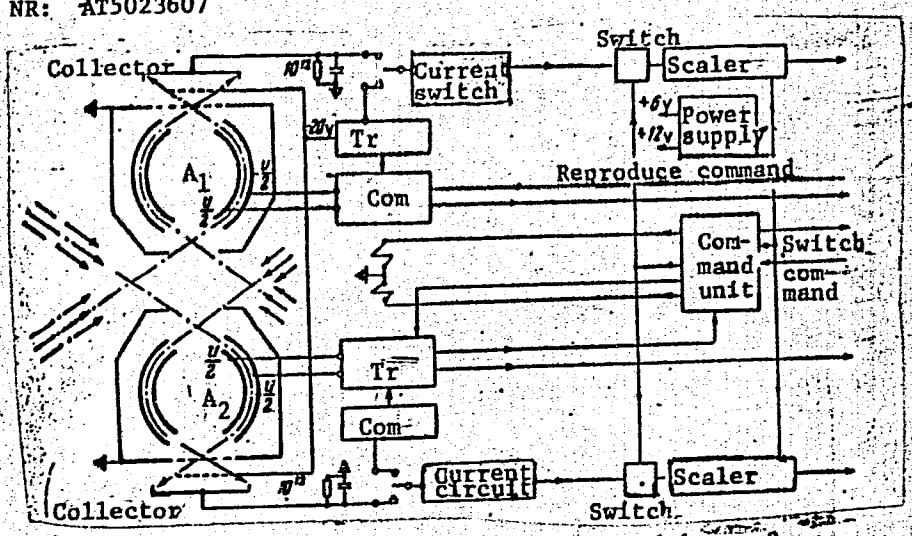

Fig. 1. Spherical particle analyzer on Elektron-2

Tr - High voltage transformers; Com - commutators; A_1 - 0.1—1 kev range; A_2 - 1—10 kev range

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L 2759-66 EWT(d)/FSS-2/EWT(l)/FS(v)-3/EEC(k)-2/FCC/EWA(d)/EWA(h) AST/ET/GW
ACCESSION NR: AP5021003 UR/0203/65/005/004/0749/0751
523.165

57
56
B

AUTHOR: Savenko, I. A.; Savin, B. I.; Mel'nikov, V. V.; Shavrin, P. I.; Markelova, T. N.

TITLE: Study of 1-kev charged particle streams by Kosmos-15

SOURCE: Geomagnetizm i aeronomiya, v. 5, no. 4, 1965, 749-751

TOPIC TAGS: charged particle measurement, satellite/Kosmos 15

ABSTRACT: A spherical electrostatic analyzer, adjusted to 1-kev electron energies and containing a +12 v grid at its opening to protect the instrument compartment from positive ion bombardment, was installed on "Kosmos-15", launched 22 April 1963. The analyzer's maximum sensitivity was 20 mv, which corresponded to $\sim 1.2 \cdot 10^7$ particles/cm^2 sec kev. The measurement program included four stages, the first two stages consisting in recording 1-kev electrons, the third stage — 1-kev positive ions, while during the fourth stage the spheres made contact with the satellite body. The cycle was thereafter repeated. Measurement results (see Fig. 1 of Enclosure) indicated the presence of two maxima at identical latitudes on either side

Card 1/3

L 2759-66
ACCESSION NR: AP5021003

of the equator, where the daily shift of these maxima exhibited a motion toward the north. Orig. art. has: 3 figures. [WC]

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta (Institute of Nuclear Physics, Moscow State University)

SUBMITTED: 050ct64 ENCL: 01 SUB CODE: ES, NP

NO REF SOV: 003 OTHER: 000 ATD PRESS: 4102

Card 2/3

L 2759-66
ACCESSION NR: AP5021003

ENCLOSURE: 01

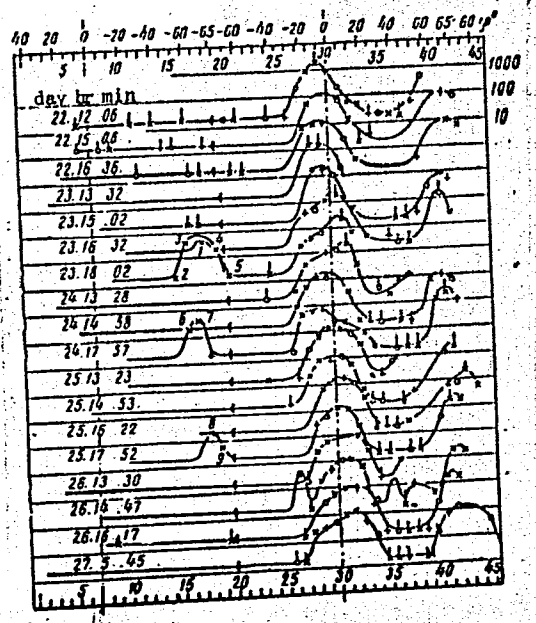

Fig. 1. Measurement results for first few days of flight

Column at left indicates date and time of passage over night equator on a given orbit. Vertical scale indicates difference in potentials on storage capacitor in mv

φ° - Geographical latitude;
+ - electron measurement;
x - positive ion measurement;
o - absence of field.

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L 1728-66 FSS-2/EWT(l)/EEC(m)/FS(v)-3 TT/GW

ACCESSION NR: AP5021009 UR/0203/65/005/004/0781/0783
550.38

AUTHOR: Mineyev, Yu. V.; Sanin, A. A.; Savin, B. I.; Gadalov, A. N.
55 55 55 55

TITLE: System for measuring weak currents used on the Electron-2 and Electron-4 satellites

SOURCE: Geomagnetizm i aeronomiya, v. 5, no. 4, 1965, 781-783

TOPIC TAGS: particle detector, detection system / Electron 2, Electron 4
55,12 56,12 55,12

ABSTRACT: A circuit used for the detection of currents caused by low-energy charged particles is described. The block diagram of the circuit is shown in Fig. 1 of Enclosure. The circuit operates as follows: The impinging particles are stored on the collector for approximately 120 sec, at which time, a RP-5 polarized relay closes the contact on command and connects the charged capacitor C to the rest of the circuit. Damped oscillations with a natural frequency of approximately 70 kc are established in the circuit. The waveform is amplified in a nonlinear amplifier and applied to a threshold circuit (Schmidt trigger). Depending on the initial charge stored on C and the threshold level, the number of pulses at the output are directly proportional to the particle current. Accuracy is controlled by the periodic discharge of a reference capacitor previously charged from the power supply.

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L 1728-66

ACCESSION NR: AP5021009

The circuit is temperature stabilized; the number of recorded impinging particles does not vary by more than ±1 in the temperature range of -25 to + 45C. The minimum detectable current is 2×10^{-15} amp when the capacitor is charged for 100 sec. The dynamic range of the detector is 10^3. During the charging period, the active circuits are disconnected from the power source. This reduces the power consumption of the circuit to 0.2 w. Orig. art. has: 3 figures and 1 formula. [BD]

ASSOCIATION: Moskovskiy gosudarstvennyy universitet. Institut yadernoy fiziki (Moscow State University. Institute of Nuclear Physics)

SUBMITTED: 22Oct64 ENCL: 01 SUB CODE: EC

NO REF SOV: 002 OTHER: 000 ATD PRESS: 4096

Card 2/3

L 1728-66

ACCESSION NR: AP5021009

ENCLOSURE: 01

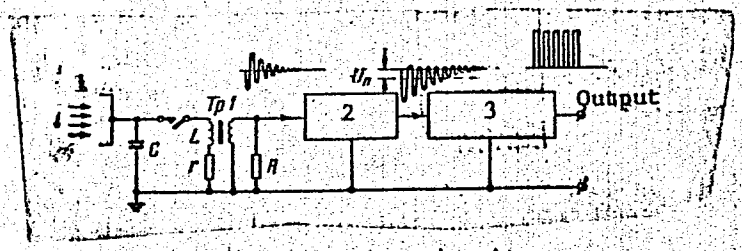

Fig. 1. Measuring circuit

1 - Collector; 2 - amplifier;
3 - discriminator.

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L 4127-66 FSS-2/EWT(1)/FS(v)-3 TT/GW

ACCESSION NR: AP5026220 UR/0048/65/029/010/1794/1799

AUTHOR: Vernov, S.N.; Mel'nikov, V.V.; Savenko, I.A.; Savin, B.I. 64 E

TITLE: Investigation of low-energy charged particles with the Cosmos 12, Cosmos 15, and Electron 2 satellites /Report, All-Union Conference on Cosmic Ray Physics held at Apatity, 24-31 August 1964/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 10, 1965, 1794-1799

TOPIC TAGS: artificial earth satellite, spectrometer, charged particle, electron flux, ion flux, low energy particle

ABSTRACT: Spherical electrostatic charged particle analyzers carried by the Cosmos 12, Cosmos 15, and Electron 2 satellites are described very briefly and preliminary results obtained with them are presented. The radii of the two concentric spherical deflecting electrodes were 5.4 and 6.6 cm, and the charged particles traversing the analyzer were collected in a Faraday cup. The minimum global intensity that could be recorded was approximately $6 \times 10^6 E_0^{-2}$ particles/cm^2 sec kev; this intensity is two orders of magnitude below the threshold intensity for the instrument carried by Explorer 12. The luminosity at maximum transmission was

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L 4127-66

ACCESSION NR: AP5026220

$0.7\ cm^2$ sterad with $\Delta E/E_0 \approx 30\%$, and the geometric factor was $0.1\ E_0\ cm^2$ sterad kev. The analyzer on the Cosmos 12 was sequentially programmed to record 0.5 kev electrons or 1 kev electrons or ions, and that on the Cosmos 15 recorded 1 key electrons or ions and was provided with a positively charged screen to reject thermal ions. The Electron 2 carried two analyzers, which were programmed to record charged particles of seven different energies ranging from 0.1 to 10 kev. The fluxes of 1 kev charged particles observed with the two Cosmos satellites were ordinarily near or below the threshold. Fluxes exceeding 10^7 particles/cm^2 sec kev observed on the daylight side are ascribed to photoelectrons from the screen, although there are indications of the presence of particle fluxes. Steady fluxes up to 2×10^7 particles/cm^2 sec kev were observed south of New Zealand in the region of the maximum southern isochasm. It is suggested that an intensity increase over the equatorial Pacific observed on 27 Dec may be associated with the solar flare of 24 Dec. The Electron 2 measurements revealed a broad region near the Earth of increased electron intensity. The extent of this region and its electron intensity fluctuated considerably. Electron intensities of 5×10^8 particles/cm^2 sec kev at 0.2 kev and 5×10^7 particles/cm^2 sec kev at 10 kev were observed in this region. Intensity increases were also sometimes observed near the apogee. Orig. art. has: 5 figures.

[15]

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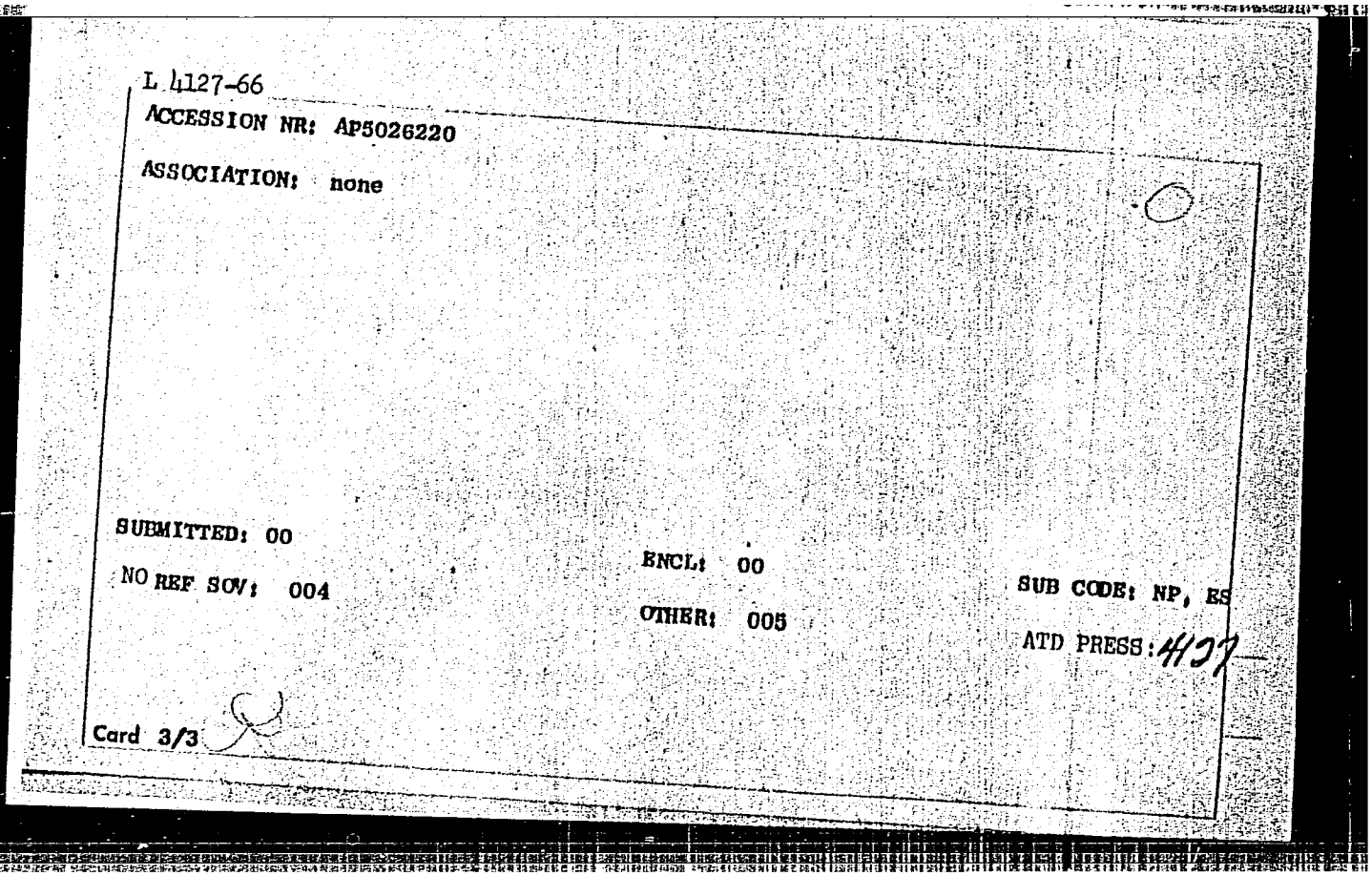

L 4127-66

ACCESSION NR: AP5026220

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: NP, ES

NO REF SOV: 004

OTHER: 005

ATD PRESS: 4137

Card 3/3

SAVIN, B.M.

Method of indirect oncometry; further considerations on the perfusion method. Fiziol. zhur. 40 no.6:734-737 N-D '54. (MLRA 8:2)

1. Kafedra fiziologii Voyenno-meditsinskoy akademii im. S.M.Kirova.
(BIOMETRY,
oncometry, perfusion method)

BORISKIN, V.V.; OBLAPENKO, P.V.; ROL'NIK, V.V.; SAVIN, B.M.

Possible development of the animal organism in case of nitrogen substitution by helium. Dokl. AN SSSR 143 no.2:475-478 Mr '62. (MIRA 15:3)

1. Institut evolyutsionnoy fiziologii im. I.M.Sechenova AN SSSR i Voyenno-meditsinskaya akademiya im. S.M.Kirova. Predstavleno akademikom V.N.Chernigovskim.

(HELIUM—PHYSIOLOGICAL EFFECT)
(INCUBATION)

ACCESSION NR: AT4042659 S/0000/63/000/000/0078/0081

AUTHOR: Boriskin, V. V.; Gul'tyayev, P. A.; Savin, B. M.

TITLE: The possiblility of developing and prolonging the existence of biological objects in a helium-oxygen atmosphere

SOURCE: Konferentsiya po aviatsionnoy i kosmicheskoy meditsine, 1963. Aviatsionnaya i kosmicheskaya meditsina (Aviation and space medicine); materialy* konferentsii. Moscow, 1963, 78-81

TOPIC TAGS: helium oxygen atmosphere, embryonic development, vital activity, chicken embryo, frog embryo, chicken, mouse, dog, temperature tolerance

ABSTRACT: A number of experiments have been performed to test the effects of a helium-oxygen atmosphere on the development of chicken and frog embryos and to determine the effects of a prolonged exposure (10 to 15 days) of chickens, white mice, and dogs to this atmosphere. A normal nitrogen-oxygen atmosphere was used for control purposes. The experimental atmospheres contained between 19 and 23% oxygen, 0.2 to 1.2% CO_2, and not more than 1 to 1.5% nitrogen. Experiments with chicken embryos indicated that when the temperatures were kept equal, there was

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ACCESSION NR: AT4042659

atmosphere at a temperature of 21 to 22°C, but those kept in a helium-oxygen atmosphere required a temperature of 24 to 25°C before temperature discomfort was relieved. The skin and muscular temperature of a dog kept in a helium-oxygen atmosphere at a temperature of 23 to 26°C was 0.7 to 0.9°C less than normal, its energy expenditures were somewhat higher, and its heartbeat rate was 10 beats higher per minute. When the atmospheric temperature was raised to 27 or 28°C, the temperature of the body tissues and the physiological functions of the animal became equivalent to those of dogs in a nitrogen-oxygen atmosphere of 19.5 to 22.5°C. The replacement of nitrogen by helium did not cause any changes in embryonic development of animals observed, provided they were kept at a somewhat higher temperature. A temperature 4 to 6°C higher than a nitrogen atmosphere is required in a helium atmosphere because of the higher heat conductivity of helium.

ASSOCIATION: none

SUBMITTED: 27Sep63 ENCL: 00 SUB CODE: LS

NO REF SOV: 000 OTHER: 000

Card 3/3

ACCESSION NR: AT4042712 S/0000/63/000/000/0426/0429

AUTHOR: Savin, B. M.

TITLE: Role of the nervous system in the reactions of the organism to acceleration

SOURCE: Konferentsiya po aviatsionnoy i kosmicheskoy meditsine, 1963. Aviatsionnaya i kosmicheskaya meditsina (Aviation and space medicine); materialy* konferentsii. Moscow, 1963, 426-429

TOPIC TAGS: acceleration, hemodynamics, cardiovascular change, acceleration effect, central nervous system, altered gravity

ABSTRACT: Hemodynamic shifts, which are among the most clearly expressed effects on the organism of acceleration, have been investigated to determine the extent to which they are produced by purely mechanical (hydrostatic) factors under conditions of increased gravity and weightlessness. Neural reflex reactions have been found to play an important determining role. Changes in the functional state of the CNS, in particular the state of the vasculomotor center and vagus nerve centers, are accompanied by variations in the activity of the reflex mechanisms governing the circulation of the blood. The following phases or periods in the

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ACCESSION NR: AT4042712

reaction of the cardiovascular system to changed gravity conditions have been distinguished: 1) the hidden compensation phase, 2) the high compensation phase, 3) the phase of developing decompensation, 4) the phase of restored compensation, and 5) the phase of transition back to the initial (normal) state. The first four occur during interaction of the organism with altered gravity conditions; the last belongs to the aftereffect period. During exposure of the organism to accelerations which are within the functional limits of toleration, only functional states of the CNS giving rise to the first three of the above-mentioned phases occur. When acceleration exceeds the limits of tolerance, the second and third phases practically disappear and pathological reflexes leading to decompensation arise almost at once. During functionally tolerable accelerations, changes in the functional state of the cardiovascular system are evoked mainly by vascular and especially venous baroreceptor stimuli of unusual strength or occurring in unusual combinations acting on the CNS. During accelerations approaching the limits of tolerance, impairment of cerebral circulation becomes important. Impairment of cardiovascular regulatory activity results in lowered adaptability of the organism and the appearance of cumulative effects. Deafferentation by resection of the vagus nerve has been found helpful in controlling the latter. The

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ACCESSION NR: AT4042712

ability of the organism to compensate changed gravity conditions and reestablish hemodynamic equilibrium is sharply increased by systematic exposure to acceleration. Adaptation of the higher nervous centers is an important part of developing a state of training in which the organism's resistance to acceleration is enhanced.

ASSOCIATION: none

SUBMITTED: 27Sep63 ENCL: 00 SUB CODE: LS

NO REF SOV: 000 OTHER: 000

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L 17790-65 EWG(j)/EWG(r)/EWT(1)/FS(v)-3/EWG(v)/EWG(a)/EWG(c) Pb-4/Pe-5
AEDC(a)/AFWL/ASD(a)-5/AMD/AFETR/AFTC(b) DD

ACCESSION NR: AP5000263 S/0301/64/010/006/0595/0600

AUTHOR: Avenirova, Ye. D.; Savin, B. M.; Sy*tinskiy, I. A. B

TITLE: The influence of hypoxia and acceleration on the content of glutaminic and gamma-aminobutyric acids in brain tissue

SOURCE: Voprosy* meditsinskoy khimii, v. 10, no. 6, 1964, 595-600

TOPIC TAGS: acceleration, hypoxia, brain metabolism, glutaminic acid, gamma aminobutyric acid, rat, brain tissue

ABSTRACT: Tests were conducted on 59 white rats weighing 120—200 gm. Accelerations took place on a centrifuge with a radius of 1.2 m. Rats were kept in a fixed position in containers on the ends of the centrifuge arms. The maximum acceleration, 18 g, was maintained for 1 min. This was followed 2—3 sec later by immediate quick freezing in nitrogen. Hypoxia tests took place in a pressure chamber 0.6 m in size. Animals were subjected to simulated altitudes of 5000 m (81 mm Hg), 10,000 m (40 mm Hg), and 15,000 m (18 mm Hg). The three stages of hypoxia were classified as compensating (Stage I) and non-compensating (Stages II & III). The duration of exposure to hypoxia

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L 17790-65

ACCESSION NR: AP5000263

was either 1 min or 30 sec. The rate of "climb" and "fall" was 50—75 m/sec. Animals were quick frozen in liquid nitrogen 3—10 sec following the test. Qualitative determination of free amino acids in brain tissue was accomplished by paper chromatography. Chromatograms were placed in a chamber for 48 hr to obtain gamma aminobutyric and glutaminic acids, and for 60 hr to obtain aspartic acid. It was found that hypoxia produced by 1-min exposures to 5000 and 10,000 m increased the content of gamma aminobutyric acid in the cerebral hemispheres by 30% and in the cerebellum by 40%, as compared to the controls. Particularly large increases were observed during acute hypoxia (15,000 m) accompanied by deoxygenation. Accelerations of 18 g did not alter the content of brain gamma-aminobutyric acid. It was concluded that these variations between the content of gamma-aminobutyric acid in brain tissues produced by acceleration and acute hypoxia reflect the difference in the mechanisms which produce these changes. Orig. art. has: 2 tables.

ASSOCIATION: Laboratoriya khimii belka Leningradskogo universiteta (Laboratory of Protein Chemistry, Leningrad University); Kafedra aviatsionnoy meditsiny* Voyenno-meditsinskoy ordena Lenina Akademii

Card 2/3

L 17790-65
ACCESSION NR: AP5000263

imeni S. M. Kirova, Leningrad (Department of Aviation Medicine, Military Medical Academy)

SUBMITTED: 27Aug63 ENCL: 00 SUB CODE: PH, LS

NO REF SOV: 013 OTHER: 008 ATD PRESS: 3153

Card 3/3

SAVIN, B.M.

Theoretical foundation of the microatmosphere in planetary spaceship cabins and possibilities for using helium-oxygen mixtures for this purpose. Probl. kosm. biol. 4:188-195 '65.
(MIRA 18:9)

L 14248-66 EWT(l)/EWT(m)/FS(v)-3/EWP(t)/EWP(b) SCTB/IJP(c) JD/DD/RD
ACC NR: AT6003853 SOURCE CODE: UR/2865/65/004/000/0188/0195

AUTHOR: Savin, B. M. 72

ORG: none

TITLE: Theoretical basis for the microatmosphere of interplanetary spacecraft cabins and prospects of using helium-oxygen mixtures for this purpose

SOURCE: AN SSSR. Otdeleniye biologicheskikh nauk. Problemy kosmicheskoy biologii, v. 4, 1965, 188-195

TOPIC TAGS: spacecraft capsule environment, space physiology, helium, oxygen, respiration, experiment animal, biologic metabolism, temperature, test chamber

ABSTRACT: Since a helium-oxygen mixture possesses a number of advantages over a nitrogen-oxygen mixture for space cabin environment, Soviet scientists have been conducting experiments to assure themselves that prolonged respiration in a helium-oxygen environment, and the absence of nitrogen for prolonged periods of time, does not have any harmful biological effect. Chick embryos and frog eggs were selected as subjects for experiments since it was felt that the particularly intense metabolic processes which

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take place in early embryonic development would provide test objects expecially sensitive to the presence of helium or the absence of nitrogen. Chick embryos allowed to develop in a helium-oxygen mixture developed normally. However, in order to achieve normal development, the temperature and humidity of the surrounding environment had to be somewhat higher than normal. Experiments performed with developing frog eggs also indicated that the only effects of high partial pressures of helium are due to its physical properties (specific heat and thermal conductivity). In short, it was shown that substituting helium for nitrogen was not an obstacle to normal embryonic development.

Experiments performed with chickens and mice have indicated that prolonged exposures to a helium-oxygen environment do not cause any physiological disruptions. However, the reactions and general behavior of the animals indicate that physiological processes are much more sensitive to the temperature of the surrounding gas mixture than they are to normal oxygen-nitrogen atmosphere. The temperature comfort zone in helium-oxygen atmospheres is 3—3.5° C higher than in normal atmospheres. If this higher temperature requirement is satisfied, all physiological processes appear to

L 14248-66

ACC NR: AT6003853

proceed normally. It is, therefore, concluded that helium can be used as one of the components of the microatmosphere of spaceship cabins.

[ATD PRESS: 4091-F]

SUB CODE: 06 / SUBM DATE: none / ORIG REF: 006 / OTH REF: 007

FW

Card 3/3

ACC NR: AT6036630 SOURCE CODE: UR/0000/66/000/000/0333/0334

AUTHOR: Savin, B. M.

ORG: none

TITLE: Physiological analysis of changes in the electroretinogram and primary responses of various parts of the visual analyzer during exposure to some extremal stresses (acceleration, pressure drops, hypoxia) [Paper presented at the Conference on Problems of Space Medicine held in Moscow from 24-27 May 1966]

SOURCE: Konferentsiya po problemam kosmicheskoy meditsiny, 1966. Problemy kosmicheskoy meditsiny. (Problems of space medicine); materialy konferentsii, Moscow, 1966, 333-334

TOPIC TAGS: space physiology, combined stress, hypoxia, biologic acceleration effect, visual analyzer, electroretinogram, cat

ABSTRACT:
Chronic experiments were performed on nonanesthetized cats. Electroretinograms (ERG) were recorded along with primary responses of the lateral geniculate bodies, the upper tubers of the lamina quadrigemia, and the visual cortex. The stimulus was produced by light flashes 1 msec in duration, with 0.6 joules energy at a distance of 4.2 m. The effects of head-pelvis accelerations (from 3--20 G with 20 sec to 2 min duration),

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of 100 m/sec pressure changes (decompression and compression), and of hypoxic hypoxia ("elevations" in a pressure chamber to altitudes of 5, 8, 10, and 12 thousand meters with a duration of 2--10 min), were investigated.

The results showed that the direction and magnitude of changes of ERG and primary responses of the brain areas in question varied, depending on the magnitude, or repetition, of the forces acting upon them. With accelerations of up to 5 G, a deterioration of ERG was observed, as well as an increase in the positive and negative phases of the primary responses of the visual cortex. Latent periods of the positive component of the responses of the lateral geniculate bodies and the visual cortex diminished. There was a weakening of the primary response of the visual cortex along with the deterioration of the ERG, with accelerations of up to 12 G. The latent period of the ERG and the positive components of the primary responses of the lateral geniculate bodies, the upper tubers of the lamina quadrigemia, and of the visual cortex increased noticeably. During large G stresses, a complete deterioration of the primary response of the visual cortex was often observed, while responses of the lateral geniculate bodies were sharply weakened. The primary response of the upper tubers of the

lamina quadrigemina showed the least deterioration. In those cases when the primary responses of the visual cortex were retained, their latent periods increased by a factor of two. During accelerations with magnitudes greater than 12 G, and also after repeated exposure to acceleration of middle magnitudes, the ERG and the primary responses of the areas investigated remained altered after acceleration ceased.

The investigators established a known similarity between the changes in ERG and the primary responses of the visual cortex during pressure drops and similar responses arising as a result of accelerations. The observed changes are regarded as a result of efferent influences in the neurovascular mechanism of the retina, and as a result of inhibition of specific afferentation. They are explained as a manifestation of defense reactions in response to a sharp increase in the general afferentation level. It was established that during early stages of hypoxia (up to 5000 m), only ERG changes (characterized by an increase in the positive phase of the response) are typical.

During elevations to altitudes of 8,000 and 10,000 m, the positive phase of the ERG becomes noticeably weaker, while the negative phase of the primary response of the visual cortex increases. During elevation to an

ACC NR: AT6036630

altitude of 12,000 m, an insignificant deterioration of the primary responses of the lateral geniculate bodies is observed, along with a sharp deterioration of the primary responses of the visual cortex. At the same time, the latent periods of the primary responses of the visual cortex are significantly increased. Even after acute stages of hypoxia, the ERG and the primary responses, in contrast with the effects of accelerations, quickly return to normal.

[W. A. No. 22; ATD Report 66-116]

SUB CODE: 06 / SUBM DATE: 00May66

Card 4/4

L 29329-66 EWT(1) SCTB DD

ACC NR: AP6017501 SOURCE CODE: UR/0219/66/061/005/0019/0023

28
B

AUTHOR: Savin, B. M.

ORG: Order of Lenin Military Medical Academy im. S. M. Kirov, Leningrad (Voyenno-meditsinskaya akademiya)

TITLE: Comparative analysis of the effect of excess G^2 and hypoxia ^{2} on oxygen tension in brain tissues

SOURCE: Byulleten' eksperimental'noy biologii i meditsiny, v. 61, no. 5, 1966, 19-23

TOPIC TAGS: acceleration stress, hypoxia, oxygen tension, brain tissue, [redacted] cat, rabbit

ABSTRACT: Cats and rabbits were subjected to acceleration stress from 2 to 23 G and hypoxia equivalent to altitudes of 5000—10,000 m in order to determine the role of hypoxia in disrupting the activity of the CNS during acceleration stress, and to clarify the effect of repeated acceleration stress on oxygen tension (pO_2) in brain tissues. Oxygen tension was determined by the polarographic method. Platinum and silver chloride electrodes were implanted 5—7 days prior to the experiment. Animals were accelerated in form-fitting containers on a centrifuge with a 2-m arm for periods of 1—1 1/2 minutes. They were subjected to "top" altitudes for periods of 1—3 minutes. In order to eliminate stress factor interaction, animals were exposed to hypoxia before acceleration in some experiments and afterwards in others. The

Card 1/2 UDC: 612.262+612.82]-014.47

L 29329-66

ACC NR: AP6017501 O

effect of the two stress factors on pO_2 in cats and rabbits was very similar, but smaller acceleration magnitudes were required to produce shifts in pO_2 in rabbits. When animals were accelerated in a head-pelvis direction at 5—7 G (cats) and 4.5—5.5 G (rabbits), pO_2 in brain tissues rose for 15—30 sec and then dropped to initial or slightly lower levels. Accelerations of 8—12 G (in cats) and 6—9 G (in rabbits) resulted in noticeable drops in pO_2. During acceleration, pO_2 remained higher than during elevation to altitudes of 5000 m. When animals were accelerated in the pelvis-head direction, even small G-loads resulted in a sharp drop in pO_2, equivalent to drops produced by elevations of 8000—10,000 m. Restoration of pO_2 after head-pelvis accelerations was smooth and began immediately after exposure. After pelvis-head acceleration, restoration of pO_2 level was slow and had a step-like character, or it took place after a phase of significant increase in pO_2. Experiments with repeated accelerations indicated that pO_2 levels in brain tissues shift even if the magnitude of G-stress is identical. However, even when animals were subjected to accelerations near the limit of tolerance, which caused a breakdown in the compensatory mechanism, the pO_2 in brain tissues remained at a higher level than during elevation to an altitude of 5000 m. Orig. art. has: 3 figures and 1 table. [BM]

SUB CODE: 06/ SUBM DATE: 09Apr65/ ORIG REF: 012/ OTH REF: 013/ ATD PRESS: 5010

Card 2/2 UC

SAVIN, B.M.

Changes in the synthesis of methyl-3a,12a-dibenzoxycholanate. Med. prom. 14 no.2:38-39 F '60. (MIRA 13:5)

1. Ukrainskiy institut eksperimental'noy endokrinologii.
(CHOLANIC ACID)

SAVIN, B.M.

Obtaining methyl-Δ^{11}-3a-acetoxycholenate. Med.prom. 14 no.6: 31-33 Je '60. (MIRA 13:6)

1. Ukrainskiy nauchno-issledovatel'skiy institut eksperimental'noy endokrinologii.

(CHOLENIC ACID)

KHARAG, I.M.; YAVLINSKIY, M.D.; SAVIN, B.M.

Improved butamide synthesis. Med. prom. 16 no.2:39-43 F '62.
(MIRA 15:3)

1. Ukrainskiy nauchno-issledovatel'skiy institut eksperimental'noy endokrinologii.

(UREA)

SLAVKOVIC, Jovan; SAVIN, Cvetan

Case of Turner's syndrome. Srpski arh. celok. lek. 84 no.11: 1303-1306 Nov 56.

1. I Interna klinika Medicinskog fakulteta u Beogradu. Upravnik: Branislav Stanojevic.
(TURNER'S SYNDROME, in inf. & child.
case report (Ser))

SAVIN,D.K., inzhener; ZENCHENKO,Yu.I., inzhener

Repair requirements in designing the KS-10 self-propelled mower.
Sel'khozmashina no.5:28-31 My '55. (MLRA 8:6)
(Mowing machines)

SAVIN, D.K., nauchn. sotr.; FRANKOVSKIY, TS.F., nauchn. sotr.; NAURUZBAYEV, S.K., nauchn. sotr.; SON, I.N., nauchn. sotr.; SUSLIN, V.D., nauchn. sotr.; MARTYUSHEV, Ye.D., nauchn. sotr.; ORLOVSKAYA, A., red.; YEGOROVA, V., red.

[Mechanization of livestock feeding] Mekhanizatsiia otkorma skota. Alma-Ata, Kainar, 1965. 237 p. (MIRA 18:7)

1. Kazakhskaya Akademiya sel'skokhozyaystvennykh nauk. Nauchno-issledovatel'skiy institut mekhanizatsii i elektrifikatsii sel'skogo khozyaystva. 2. Kazakhskiy nauchno-issledovatel'skiy institut mekhanizatsii i elektrifikatsii sel'skogo khozyaystva (for all except Orlovskaya, Yegorova).

ACC NR: AP7006199 (A) SOURCE CODE: UR/0363/67/003/001/0026/0028

AUTHOR: Kulikov, G. S.; Boltaks, B. I.; Savin, E. P.

ORG: Institute of Semiconductors, Academy of Sciences, SSSR (Institut poluprovodnikov Akademii nauk SSSR)

TITLE: Diffusion of phosphorus through an oxide film in silicon

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 3, no. 1, 1967, 26-28

TOPIC TAGS: phosphorus, silicon dioxide, silicon, physical diffusion

ABSTRACT: In order to determine the causes of the masking effect of oxide films on the surface of silicon, experiments were conducted on the diffusion of phosphorus in oxide layers and also in silicon through oxide layers of various thicknesses. Diffusion coefficients measured for phosphorus in quartz as an analog of an oxide film on silicon, and also values of the activation energy and preexponential factor D_0 indicate that starting at 1000°C and above, the diffusion coefficient of phosphorus in silicon dioxide is smaller than in silicon. The masking effect of oxide layers on silicon during the diffusion of phosphorus (for moderate times) is due to a limitation of the concentration of the diffusing impurity on silicon under the oxide layer. This is caused by the small value of the diffusion coefficient of phosphorus in SiO_2 as compared to diffusion in silicon. The masking effect also arises in the diffusion of elemental phosphorus and when the source of the diffusion is phosphorus

Card 1/2 UDC: 546.18:532.72:546.28

ACC NR: AP7006199

pentoxide. At 1100°C (source temperature 325°C) and a diffusion time of 6 hr, a good masking effect is provided by oxide layers 0.6 micron thick. Orig. art. has: 5 figures.

SUB CODE: 07,20/ SUBM DATE: 13Dec65/ OTH REF: 004

Card 2/2

L 31963-65 EWT(m)/EWP(w)/EWA(d)/EWP(t)/T/EWP(b) DIAAP/IJP(c) JD/JG

ACCESSION NR: AP5004383 S/0056/65/048/001/0122/0124

AUTHOR: Kul'kov, V. D.; Kogan, A. V.; Nikitin, L. P.; Savin, E. P.; Stel'makh, M.F.

TITLE: Internal magnetic field in W and Ru atoms dissolved in iron

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 1, 1965, 122-124

TOPIC TAGS: tungsten, ruthenium, anisotropy, Gamma emission, internal magnetic field, low temperature research, ferromagnetism

ABSTRACT: The experimental set-up used to measure the internal field acting on the nuclei embedded in the iron was described earlier (ZhTF, v. 29, 1419, 1959). The field was determined from the anisotropy of the gamma radiation emitted by the radioactive nuclei W^{187} and Ru^{103}, oriented at very low temperatures. A value of 1.1×10^6 Oe was obtained for W^{187}. In the case of Ru^{103} the sign of the asymmetry of the gamma radiation could be established and the decay scheme made more precise, but owing to the excessive error the value of the internal field could not be determined. "The authors thank Professor O. Ye. Zvyagintsev for supplying the

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L 31963-65
ACCESSION NR: AP5004383

spectrally pure ruthenium." Orig. art. has: 3 figures, 3 formulas, and 1 table.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe Akademii Nauk SSSR (Physicotechnical Institute, Academy of Sciences SSSR)

SUBMITTED: 23Jul64 ENCL: 00 SUB CODE: EM, SS

NR REF SOV: 002 OTHER: 003

Card 2/2

5.3100
5.4130

67152

SOV/51-7-6-4/38

AUTHORS: Savin, F.A. and Sobel'man, I.I.

TITLE: Intensities of the Raman Spectra and the Metallic Model of a Molecule. I. Polyene Compounds.

PERIODICAL: Optika i spektroskopiya, 1959, Vol 7, No 6, pp 733-739 (USSR)

ABSTRACT: Some properties of the molecules containing conjugated double bonds can be satisfactorily represented using the metallic model. The present paper describes an application of the general metallic model method of Sobel'man (Ref 2) to calculation of the Raman spectral intensities of polyene compounds. The results of the calculation were found to be in satisfactory agreement with experimental data. For example the ratios of the intensities of the ultraviolet absorption bands of butadiene, hexatriene and octotetraene (at 47700, 39750 and 33100 cm^{-1} respectively) were calculated to be:

$$I_{but.}:I_{hex.}:I_{oct.} = 1:16:200.$$

The experimental values (given in col 10 of a table on p 738) are:

$$I_{but.}:I_{hex.} = 1:10$$

i.e. they are in satisfactory agreement with the calculated intensities (no quantitative data were available on octotetraene). The

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Intensities of the Raman Spectra and the Metallic Model of a Molecule. I. Polyene Compounds

approximations used for polyene molecules may be used also to calculate the Raman line intensities of benzene and other aromatic compounds; this is done in Part II of the present paper (see the following abstract). The paper is entirely theoretical. Acknowledgment is made to P.A. Bazhulin for his advice. There are 1 table and 15 references, 12 of which are Soviet, 1 English and 2 German.

SUBMITTED: March 20, 1959

Card 2/2

SOV/51-7-6-5/38

AUTHORS: Savin, F.A. and Sobel'man, I.I.

TITLE: Intensities of the Raman Spectra and the Metallic Model of a Molecule. II. Aromatic Compounds

PERIODICAL: Optika i spektroskopiya, 1959, Vol 7, No 6, pp 740-743 (USSR)

ABSTRACT: The present paper is a continuation of Part I (see the preceding abstract). The relative intensities of the Raman spectral lines of aromatic compounds are calculated using Sobel'man's metallic model method (Refs 1, 2); the application of this method to polyene molecules was described in Part I. Using benzene, toluene and deuterobenzene as examples, the authors show that the theoretical values are in satisfactory agreement with experimental data (Refs 6, 7). The paper is entirely theoretical. Acknowledgments are made to P.A. Bazhulin for his advice and to A.M. Bogomolov who made available the results of his calculations of the vibrational forms. There are 1 figure, 1 table and 7 references, 6 of which are Soviet and 1 English.

SUBMITTED: March 20, 1959

Card 1/1

L 13095-63 BDS/EWT(1) APTC/ASD

ACCESSION NR: AP3003409 S/0051/63/015/001/0042/0047

52
50

AUTHOR: Savin, F.A.

TITLE: Intensities in Raman spectra and the metallic molecular model. 3. Intensities and degrees of polarization in the spectra of aromatic compounds

SOURCE: Optika i spektroskopiya, v.15, no.1, 1963, 42-47

TOPIC TAGS: Raman spectrum, metallic molecular model, polarization, benzene, toluene, xylene

ABSTRACT: The usual method of calculating Raman spectra intensities is not applicable to molecules containing delocalized π-electrons. Hence it is of interest to attempt calculations of the intensities in the Raman spectra of such molecules on the basis of the metallic model which takes into account delocalization of the common electrons and non-additivity of the optical properties. Accordingly, the author used the method proposed by I.I.Sobel'man (Sbornik trudov pamyati G.S.Landsberga, M.1959 and Izv.AN SSSR, Ser.fiz.,22, 1026) to calculate the intensities and polarizations of some of the Raman lines of benzene, toluene and ortho-, para- and meta-xylene. For the calculations the displacements of the ring nuclei incident to vibration are assumed to consist of displacements due to changes in the ring

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L 13095-63
ACCESSION NR: AP3003409

2

bond lengths, without change of symmetry, and displacements of the nuclei from the compressed or elongated ring positions with no change in the length of the ring but some change in its symmetry. The pertinent tensor equations are adduced. The results of numerical calculations of the intensities and degrees of polarizations of some of the lines in the Raman spectra of the above-mentioned aromatic hydrocarbons are tabulated and compared with experimental data. Only two constants, evaluated from experiment, are used in the calculations. The calculated values are in reasonably good agreement with experiment. The calculations indicate that the intensity of polarized lines associated with vibrations of ring nuclei is more strongly dependent on the frequency of the exciting light than is the intensity of depolarized lines. "The author thanks P.A.Bazhulin and I.I.Sobel'man for valuable discussion of the results." Orig.art.has: 25 formulas and 1 table.

ASSOCIATION: none

SUBMITTED: 10Dec62 , DATE ACQ: 30Jul63 ENCL: 00

SUB CODE: PH,CH NO SOV REF: 008 OTHER: 003

Card 2/2

L 20254-66 EWT(1)

ACC NR: AP5027666 SOURCE CODE: UR/0051/65/019/005/0743/0750

AUTHOR: Savin, F. A.

ORG: none

TITLE: Intensities in spectra of composite scattering and metallic pattern of a molecule. IV. Composite scattering of light near the absorption band of some aromatic molecules.

SOURCE: Optika i spektroskopiya, v. 19, no. 5, 1965, 743-750

TOPIC TAGS: spectroscopy, light scattering, absorption band, depolarization, benzene

ABSTRACT: The metal pattern was used during a study of the intensity and the degree of depolarization of spectral lines of composite scattering near the absorption band of molecules containing an aromatic n-member ring having displaced π - electrons. The polarization of spectral lines near the absorption band was discussed on the basis of the resolved problem on the plane vibration of X_n Y_n - type molecules having D_{nh} symmetry. Since the transition $A_{1g} \rightarrow {}^1B_{2n}$ in the benzene molecule is forbidden, the appearance of an absorption band at $\lambda = 2600$ A in the spectra of benzene vapors was caused by the distortion of molecular

Card 1/2 UDC: 535.375.001.1

L 20254-66

ACC NR: AP5027666

2

symmetry affected by the vibration of the $E_g^{(+)}$-type nuclei. The low-frequency vibration (ω_o = 606 cm^{-1}) of the nuclei of the aromatic ring played the main role in the phenomenon observed. According to the metallic pattern of the model, the oscillator strength for this band can be expressed through the parameter D as $f = \frac{2ma^2}{h^4} D^2(\delta S'^2 + \delta S''^2)$, where m is the electron mass, a is the length of the C-C band in benzene, and D is determined from the formula given in the previous work on the subject (F. A. Savin, Opt i spektr., 15, 42, 1963) as 5.1 X X 10^{-4}erg/cm; $\delta S' = 2.78 \cdot 10^{-10}$ cm (for vibrations of 606 cm^{-1}). The obtained value $f \sim 10^{-3}$ agreed well with the experimental value ($1.4 + 10^{-3}$) determined by A. Albrecht (J. Chem. Phys., 33, 169, 1960). The author thanks P. A. Bazhulina and I. I. Sobel'man for discussion of results. Orig. art. has: 45 formulas and 1 fig.

SUB CODE: 20/ SUBM DATE: 10Jul65/ ORIG REF: 009/ OTH REF: 008

FW

Card 2/2

L 42902-66 EWT(l) IJP(c) WW/GG

ACC NR: AP6018440 SOURCE CODE: UR/0051/66/020/006/0989/0995

53
51
B

AUTHOR: Savin, F. A.

ORG: none

TITLE: The correspondence between the semiclassical and quantum mechanics theories of oscillatory combination scattering of light by molecules

SOURCE: Optika i spektroskopiya, v. 20, no. 6, 1966, 989-995

TOPIC TAGS: quantum mechanics, diatomic molecule, light scattering, excited state, ground state

ABSTRACT: The tensor of combination scattering $\beta_{\rho\sigma}$ for the $0\text{-}\nu_1$ transition was analyzed for diatomic and polyatomic molecules. While there is a certain qualitative correspondence between the semiclassical and quantum mechanics theories, there are also several phenomena which are considered by the quantum mechanics theory but cannot be explained by the semiclassical theory. Thus, the semiclassical theory does not consider the anharmonicity of nuclear oscillations in the ground state and in the excited states, nor does it offer a derivation of the electrooptical anharmonicity. The tensor $\beta_{\rho\sigma}$ was calculated in the Condon approximation; however, when $\beta_{\rho\sigma} \neq 0$, the Placzek frequency region frequently differs for various oscillations of the same molecule.

UDC: 535.375.001.1

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L 42902-66
ACC NR: AP6018440

Thus, the main inconsistency of the semiclassical theory is the insufficient consideration of the properties of the excited states. The author thanks P. A. Bazhulin (Deceased) and I. I. Sobel'man for their interest in the work and for discussing the results. Orig. art. has: 15 formulas.

SUB CODE: 20/ SUBM DATE: 07Dec64/ ORIG REF: 007/ OTH REF: 003

Card 2/2

LESKOV, L.V.; SAVIN, F.A.

Relaxation of nonequilibrium gas systems. Usp. fiz. nauk 72 no.4:741-764 D '60. (MIRA 13:11)
(Gases) (Thermodynamics)

87544

S/053/60/072/004/004/006
B029/B056

11.6300

AUTHORS: Leskov, L. V., Savin, F. A.

TITLE: Relaxation of Non-equilibrium Gas Systems

PERIODICAL: Uspekhi fizicheskikh nauk, 1960, Vol. 72, No. 4, pp. 741-764

TEXT: This is a review of papers on this subject, the results obtained by various research scientists are compared and the most reliable values of the constants are given. In this, the authors confine themselves to problems of equilibrium adjustment with respect to the translational, rotational, and oscillational degrees of freedom, and also with respect to dissociation and ionization. Only the most important molecules are taken into account. The first part of this article deals with the potential energy of colliding particles. In inelastic collisions (L. Landau and E. Teller, Ref. 27), usually a function for the exponential repulsion: $V_{exp}(r) = Ae^{-\alpha r}$ is chosen, where α is the range of interaction forces. The second part deals with energy conversion in collision, and in the third part, a quantum-mechanical description of such collisions is given. The

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cross sections σ_i of inelastic collisions and also the probabilities $P = \sigma_i/\sigma_e = 1/z$ of inelastic transition in "elastic" collisions may be calculated by quantum-mechanical methods, a classical calculation being insufficient. As an example, the production of oscillations of a diatomic molecule is discussed. Attractive forces in remote action were taken into account by Ye. Ye. Nikitin in a semi-classical study. The next chapters deal with the relaxation of translational, rotational, and oscillational energy, dissociation and ionization, as well as with the methods of determining the relaxation constants. Nine of such methods are enumerated and briefly described. In the last chapter, the relaxation constants are discussed. The following conclusions were drawn from an analysis of the tables: The cross sections of the various elementary processes differ considerably, and the degrees of freedom of gases may be subdivided into "active" (where equilibrium is established after a few collisions) and "inert" degrees of freedom (in which equilibrium is established only after many collisions). The former comprise translational motion and rotation, and the latter oscillations. The relaxation times for the oscillational degrees of freedom and the constants of the reaction

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Relaxation of Non-equilibrium Gas Systems

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B029/B056

rates of dissociation depend largely on the gas temperature T. The dissociation rate grows considerably with increasing temperature. The rates of relaxation of the vibrations of nitrogen and of the dissociation of oxygen at 3000°K are of the same order. Within the same temperature range, the production of NO plays an important part, viz., according to the scheme suggested by Ya. B. Zel'dovich: $O_2 \rightleftarrows 2O$, $O + N_2 \rightleftarrows NO + N$, $N + O_2 \rightleftarrows NO + O$. The probabilities of inelastic transitions occurring in collisions depend largely on the nature of the colliding particles. The results obtained by various research workers differ considerably. There are 1 figure, 4 tables and 174 references: 29 Soviet, 136 US, 4 British, 5 German, and 6 Japanese.

Card 3/3

SAVIN, F. D.

USSR/Nuclear Physics - Cosmic Rays
Nuclear Physics - Ionization Chambers

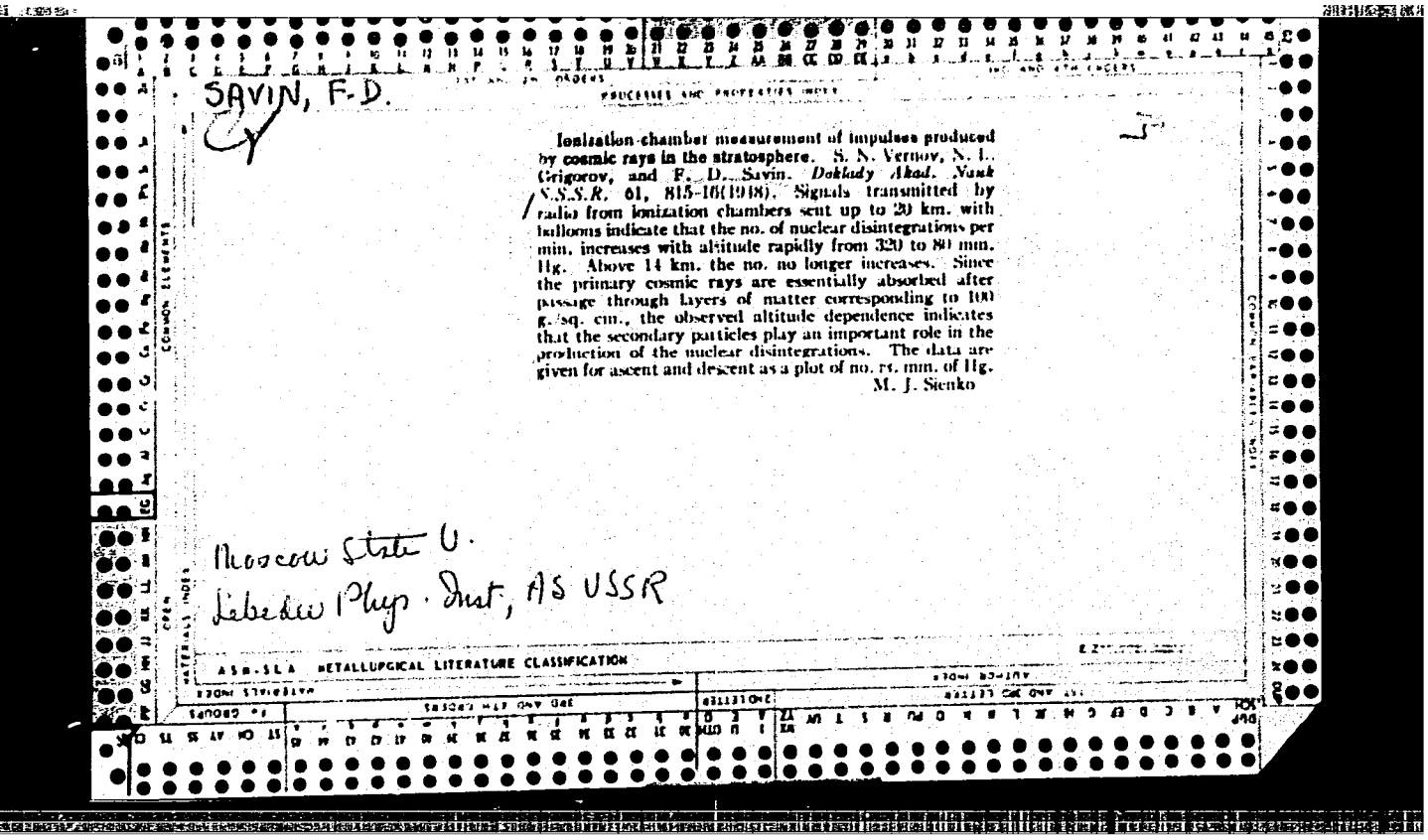
Jul 47

"Study of the Transitional Effect of Cosmic Rays in the Stratosphere With an Ionization Chamber," S. N. Vernov, N. L. Grigorov, F. D. Savin, Phys Inst imeni P. N. Lebedev, Acad Sci USSR, and Moscow State U imeni M. V. Lomonosov, 4 pp

"Dok Akad Nauk SSSR, Nova Ser" Vol LVII, No 2

Gives results of measurements of transitional effects of cosmic rays in stratosphere with aid of ionization chamber and calculating machine, utilizing special pibal equipment, which permitted measurements of ionization of number of particles in the 1 cm lead covering of apparatus. Submitted by Academician S. I. Vavilov, 12 May 1947.

PA60T79



SAVIN, F.D.

Ionization-chamber measurement of impulses produced by cosmic rays in the stratosphere. S. N. Vernov, N. L. Grigorov, and F. D. Savin. *Doklady Akad. Nauk S.S.S.R.* 61, 815-16(1948). Signals transmitted by radio from ionization chambers sent up to 20 km. with balloons indicate that the no. of nuclear disintegrations per min. increases with altitude rapidly from 320 to 80 mm. Hg. Above 14 km. the no. no longer increases. Since the primary cosmic rays are essentially absorbed after passage through layers of matter corresponding to 100 g./sq. cm., the observed altitude dependence indicates that the secondary particles play an important role in the production of the nuclear disintegrations. The data are given for ascent and descent as a plot of no. vs. mm. of Hg.
M. J. Sienko

Moscow State U.
Lebedev Phys. Inst, AS USSR

SAVIN, F. D.

USSR.

Generation of the electronic-photonic component by primary cosmic radiation particles of various energies. S. I. Brikker, N. L. Grigorov, I. V. Rybin, and F. D. Savin. *Doklady Akad. Nauk S.S.S.R.* 86, 1089–92(1952).—In order to obtain data about the generation of π^0-mesons, whose decay is assumed to be the main source of the electronic-photonic component, measurements of the transition effect have been carried out at the magnetic latitudes 31 and 51°. It is concluded that the generation of mesons occurs in cascades. Primary particles of energies of about 20,000 m.e.v. transfer about 25% of their energy to π-mesons in their 1st collisions with a light nucleus, and the production of π-mesons by such primaries takes place in 3–4 cascades. The production of π-mesons by primaries of about 3000 m.e.v. takes place in 1–2 cascades. E. Gora

SAVIN, F.D.

20-1-18/54

AUTHOR: Alekseyeva, K.I., Brikker, S.I., Grigorov, N.L, Savin, F.D., Shcherbakov, N.A.

TITLE: Determination of the Flux of Primary Cosmic Ray Particles at 31°N. Latitude
(Opredeleniye potoka pervichnykh kosmicheskikh chastits na shirote 31° N.)

PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol. 115, Nr 1, pp. 71 - 74 (USSR)

ABSTRACT: On the occasion of the determination of the cross-section of the non-elastic interaction of the cosmic ray particles with the nuclei of carbon and hydrogen the authors determined the intensity of the hard components in stratosphere. These measurements made possible the determination of the flux of the cosmic particles at the border of atmosphere. The authors describe the apparatus for the measurements of the cross-section of non-elastic interaction as well as the results of the measurements of the intensity of hard components. (The results of the measurements of the cross-sections shall be published in later works). The scheme for the arrangement of the filters as well as of the counter is shown by means of a sketch. The telescope and the filters were surrounded by many hodoscopic counters for the re-

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20-1-18/54

Determination of the Flux of Primary Cosmic Ray Particles at 31° N. Latitude

ASSOCIATION: Moscow State University im. M. V. Lomonosov
(Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova)

PRESENTED BY: D.V. Skobel'tsyn, Academician, January 15, 1957

SUBMITTED: January 12, 1957

AVAILABLE: Library of Congress

Card 3/3

Determimation of the Flux of Primary Cosmic Ray Particles at 31°N. Latitude

gistration of secondary particles. Furthermore three series of telescopic counters were connected in form of a hodoscope. The impulse for the control of this apparatus was the triple coincidence in the three series of counter. All results obtained with these apparatuses were transmitted to the ground by radio. The elaboration of the measurement results obtained this way are discussed for the following cases: single particle, shower which developed outside the filter, shower in the upper part of the apparatus and shower in the lower part of the apparatus. The course of particles as a function of altitude which cause no interactions in a Pb and Al filter is shown by a diagram. Another curve shows the number of the nuclear interactions in Pb and Al filter. Another curve is the sum of the two mentioned curves, that is to say, it characterizes the total flux of the particles of the hard component at various altitudes. This flux is 2,0 particles/cm^2 mm. sterad at the border of atmosphere. In the end the results obtained are compared with those of other authors. There are 2 figures.

SOV/120-58-6-25/32

AUTHORS: Grigorov, N. L., Rapoport, I. D., Murzin, V. S., Savin, F.D.

TITLE: A Registering Device for the Amplitude Recording of 49 Pulses of a Large Dynamic Range (Registrator dlya amplitudnoy zapisi 49 impul'sov s bol'shim dinamicheskim diapazonom)

PERIODICAL: Pribory i tekhnika eksperimenta, 1958, Nr 6, pp 109-110, (USSR)

ABSTRACT: The instrument is used for the recording of pulses whose duration is longer than 3×10^{-5} sec. It consists of 49 miniature oscillographic tubes, type 8L029, the screens of which can be photographed onto a single frame. The tubes occupy a square area, having dimensions of 64 x 64 cm. The circuit of a tube is as shown in the figure on p 110. It is seen that, apart from the voltage supplies, the circuit contains an amplifying stage; this has a gain of 38 and gives a

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A Registering Device for the Amplitude Recording of 49 Pulses of a Large Dynamic Range

rise time of 30-40 μ sec. The paper contains 1 figure and 1 Soviet reference.

ASSOCIATION: Nauchno-issledovatel'skiy institut yadernoy fiziki MGU (Scientific Research Institute for Nuclear Physics of the Moscow State University)

SUBMITTED: December 23, 1957.

Card 2/2

21(7) SOV/56-37-3-2/62

AUTHORS: Alekseyeva, K. I., Brikker, S. I., Grigorov, N. L., Murzin, V. S., Savin, F. D.

TITLE: Investigation of the Production of π^0-Mesons in the Stratosphere in the Case of Interaction of Protons and α-Particles of Cosmic Rays With Carbon Nuclei

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 3(9), pp 596 - 603 (USSR)

ABSTRACT: In the present paper the authors describe the carrying-out of and the results obtained by experiments serving the purpose of determining the average π^0-energy at an altitude of 25 km. The experiments themselves had taken place on September 20, 1954 at a geomagnetic latitude of 31° N; measurement data were transmitted to the earth radiotelegraphically. For the purpose of determining $\overline{E}_{\pi^0}$, the ionization in the maximum of the γ-cascades occurring in π^0-decay was measured. The average primary energy of the protons $\overline{E}_{op}$ was 20 Bev, that of the α-particles $E_{o\alpha}$ amounted to 40 Bev. The experimental arrangement (schematically shown by figure 1) consisted essentially of pulse ioni-

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zation chambers and a hodoscope. The counters were Geiger-Mueller counters connected in triple coincidence. The entire arrangement is described in detail. The results are shown in form of a table and by figure 2. Figure 2 in three diagrams shows the number of showers N, in which the given ionization was found, as a function of J/J_o in the lower chamber (II). J_o denotes the probable ionization of a relativistic simply charged particle, J the ionization of the given particle. The uppermost diagram contains the range $0 < (J/J_o)_I < 30$, the middle one $3.0 < (J/J_o)_I < 7.5$, and the third $(J/J_o) > 7.5$. The unbroken lines refer to measurements carried out with the help of a graphite filter, the dotted lines show the spectrum without such a filter. The average number of the electrons $\bar{\nu}$ in the maximum of the γ-cascade is calculated by means of formula (2). Results:

Investigation of the Production of π^0-Mesons in the Stratosphere in the Case of Interaction of Protons and α-Particles of Cosmic Rays With Carbon Nuclei

SOV/56-37-3-2/62

	Primary particles: protons	α-particles
J/J_0 in chamber I	0 - 3.0	3.0 - 7.5
$\overline{V}$	11.4 ± 3.5	32.2 ± 23.0
Number of electrons in the avalanche N_{max}	26 ± 8	73 ± 52
$\overline{E}_{\pi^0}$ [ev]	$(2.1\pm0.6)\cdot10^9$	$(5.8\pm4.2)\cdot10^9$
$(\overline{E}_{\pi^0}/\overline{E}_0)\cdot100$ [%]	10±3	14±10

For the determination of N_{max} formula (1) by Tamm and Belen'kiy is used. For the given primary energies of protons and α-particles (20 and 40 Bev respectively) the following values are obtained for the energy fraction k contributed by these particles for π^0-production: $k_p = (10\pm3)\%$ and $k_\alpha = (14\pm10)\%$.

L. G. Landsberg participated in this work. The authors thank I. P. Ivanenko for discussions. There are 2 figures, 1 table, and 10 references, 7 of which are Soviet.

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Investigation of the Production of π^0-Mesons in the Stratosphere in the Case of Interaction of Protons and α-Particles of Cosmic Rays With Carbon Nuclei SOV/56-37-3-2/62

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: March 7, 1959

Card 4/4

ACCESSION NR: AT4037652 S/2981/64/000/003/0105/0119

AUTHOR: Rutman, M. M.; Savin, F. I.; Balakhontsev, G. A.; Cherepok, G. V.; Zinov'yev, V. K.

TITLE: Properties of V92 alloy ingots

SOURCE: Alyuminiyevy*ye splavy*, no. 3, 1964. Deformiruyemy*ye splavy* (Malleable alloys), 105-119

TOPIC TAGS: aluminum magnesium zinc alloy, V92 alloy, continuous alloy casting, alloy heat treatment, alloy property

ABSTRACT: A technique for production-scale melting and continuous casting of V92, an aluminum-base alloy (3.75% Mg, 2.75% Zn, 0.8% Mn, 0.2% Ti) is described. Round (225—1100 mm in diameter) and flat (250 x 1400 mm) ingots were cast. The high Mg content of the alloy required addition of about 0.001% Be. No difficulties were encountered in casting round ingots. The pouring rates used corresponded to the lower limit of those used for AMg6 alloy. For ingots less

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ACCESSION NR: AT4037652

than 500 mm in diameter, a factor K = VD = 1.1 m^2/hr (where V is pouring rate and D — input diameter) should be used. In casting flat ingots special precautions had to be used to prevent formation of cracks, hot (at high pouring rates) or cold (at low pouring rates). When proper conditions are maintained strictly, sound ingots with a clean surface are obtained. Flat 250 x 1400 mm ingots were cast at a rate of 53—58 mm/min at a metal temperature of 680—700C. Immediately after casting, the ingots are homogenized to prevent cracking. All ingots had comparatively homogeneous microstructure. No appreciable segregation of Mn, Si, and Fe and no unusual segregation of Zn and Mg was observed. The density of the metal varied from 2.72 to 2.735 g/cm^3. When homogenized at 415—435C for 24 hrs, V92 alloy has a yield strength of 15—21 kg/mm^2, a tensile strength of 23—29 kg/mm^2, and an elongation of 3—6%. When solution heat treated at 450 ± 5C for 3 hrs and naturally aged for 7 days the alloy has yield strength and tensile strength to 23—28 and 28—32 kg/mm^2, respectively, with only an imsignificant decrease in elongation. Orig. art. has: 15 figures and 1 table.

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